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# The Structure Model of Methodical System Usage Fitness-Technology in Student Physical Education

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**Abstract**

The article describes the model of a methodical system of fitness technology usage in the student physical education process. The structure of the author's model consists of motivational-target, content-organizational, technological and control-diagnostic blocks. The target block is formed by the purpose, tasks, functions, system of knowledge and skills, the structure of physical training, which aims at the formation of harmoniously developed highly qualified future specialists. The content-organizational block is based on the general didactic and partially didactic principles, and also meets the criteria of selection of the means and forms of fitness technologies. The foundation of the technological block is the educational-methodical complex in the discipline "Physical education" (lectures, practical, consultations, independent lessons, manuals, methodical recommendations, sets of tasks, means for self-preparation, test complexes, evaluation criteria of students in physical education, etc.). It is the technology of teaching physical education that reveals the conditions for the functioning of the methodical system, that is, in our case, the planned use of fitness technology to ensure the fulfilment of physical education tasks. The control-diagnostic block provides for monitoring and evaluating the effectiveness of the use of fitness, which allows checking the formation of the target, content, organizational and technological blocks of the methodical system.

**Keywords:** physical culture, methodical, model, fitness, students.

## 1. Introduction

A model of the methodical system of fitness technology usage was created following the changes taking place in Ukraine in connection with the integration of Ukrainian to European educational space. The model at the same time takes into account the components of the pedagogical process: the purpose, tasks, methodological approaches, principles, methods, forms, means and the ultimate goal, namely the training and education of the personality of the future specialist, which has perfect fitness and fitness skills and ability to apply fitness technologies in life. All this has led to the modernization and creation of a new methodical system, which should preserve in the institutions of higher education of Ukraine a certain level of physical fitness and health of student youth, ensure it's readiness for professional activity (Donchenko et al., 2020; Ivanchykova et al., 2018). We modelled the methodical system based on the developed concept, which is based on the basics of the theory and methods of physical education, the theory of professional training of specialists, as well as on the recommendations of specialists (Butenko et al., 2017; Shkola et al., 2019) of individual components of the training system at different ages.

## 2. Materials and Methods

For carrying out a pedagogical forming experiment on the introduction of methodical system application a control (CG) and experimental (EG) groups of students were created, which by their general characteristics and indicators of success did not differ from the general population of students of the faculties, which prepare future teachers. A representative sample of students was identified where 573 students (257 men, 316 women) were recruited to the final stage of the experiment. Ascertaining stage included conducting a pedagogical experiment aimed at researching: physical fitness, health status, morphofunctional development, professionally important psychological qualities, emotional state and mental capacity of students. According to the results of the ascertaining stage of the experiment, the effectiveness of training in fitness technologies as a means of physical education of students was also found

out. The formative stage of the pedagogical experiment involved the experimental verification of the effectiveness of the proposed methodical system. Control tests were conducted at the end of the first semester (December) and the end of the school year (May-June). All program requirements and tests in the control and experimental groups were identical and compiled according to the requirements of the physical education program. The main difference between the educational process in the experimental groups and control groups was the introduction of a methodical system application in the physical education of students. Following theoretical methods were used: study and analysis of scientific, pedagogical, philosophical, methodical literature, curricula, curricula documents; synthesis; generalization. Empirical methods include observation, method of system analysis, method of comparison, method of functional-structural analysis.

**3. Results and Discussion**

A model is a symbolic system by which one can reproduce the didactic process as a subject of study, show the whole of its structure and function, preserve this integrity at all stages of the study. By modelling, you can not only reproduce the static of the didactic process, but also its dynamics. The presence of a science-based model of the educational process allows predicting its development. This is especially important for the educational process because it should be sure to predict and predict the future positive result (Zhamardiy et al., 2020). According to Slastenin et al. (2007), who's defined that the pedagogical model is a model that reflects the interconnections and interdependencies between the projected qualities and personality traits as an object of pedagogy and the process of its development, as well as the organization of the pedagogical system within which it takes place and manages it. Reference source (Batyshev, 1999) show that education models are formed means of sign systems, thinking analogues (logical constructs) that schematically reflect educational practice as a whole or its fragments. They are classified as descriptive, functional, predictive. *The model methodical system* is considered by us as a descriptive model of education since it is developed for the first time in the system of physical education and physical fitness activity. This model can give an idea of the purpose, tasks, structure and basic elements of fitness and fitness activity using fitness technologies. Therefore, the purpose, functions, principles of students' physical-fitness activity can be considered as the content and technology, organizational and methodical support, psychological and pedagogical conditions of methodical system functioning. Depending on the purpose of use, according to Abdullin (2008), the model methodical system can perform the following functions: *descriptive* (is a guideline when choosing methods and techniques of training, education, management), *effective* (allows to use the model in training or management) and *prognostic* (final check of vitality and the expediency of the model). The methodology of the concept of building a methodical system was built based on *methodological*, *theoretical* and *practical* concepts. These concepts Hryban (2012) regard the student as a personality, individual, subject of his activity, which is a certain system and promotes the acquisition of systematic educational knowledge in the field of physical culture and sports, provides the development of physical abilities, skills and skills, the formation of physical and fitness competences, which are needed for the introduction of physical culture and sports in the field of professional activity and life situations.

The *methodological concept* was intended to reflect the interconnection and interaction of scientific approaches to the modernization of physical education according to the changes occurring in the education system of Ukraine and the updating of the methodical support in physical education. Aiming at the development of fitness and wellness competencies, ensuring physical fitness and efficiency, good health and acquiring the skills to maintain a healthy lifestyle. In doing so, we applied different approaches: *the humanistic approach*; *a systematic approach*; *activity approach*; *a personality-oriented approach*; *an innovative approach*; *cultural approach*; *competency approach*.

*The theoretical concept* defined the system of initial parameters and assessments, which are the basis for disclosing the content and structure of fitness technologies application methodical system as a pedagogical phenomenon, which included such basic provisions:

- standardization, systematicity and continuity, integrated, systematic, activity-based approaches and humanization are the prerequisites for a single educational space in which a fitness technologies usage methodical system should operate;

- physical education activities in HEI should be the main system-forming component of the health and recreation system, which ensures the state of health, the level of general and special physical fitness of students;

- leading element in the methodical system should be the principle of integration of the fundamental and wellness orientation of content, forms, methods and means of teaching;

- the content of fitness technologies application methodical system requires updating and modernization of the physical and fitness activity following the changes during the introduction of modern technologies in the educational process in Ukrainian HEI. These changes have their peculiarities in every educational establishment;

- the openness of fitness technologies application methodical system for the introduction of innovative health technologies, improvement and updating of traditional and national Ukrainian systems of physical education of students.

*The practical concept* was to check the effectiveness of the functioning of the methodical system, this test was to provide students with the skills to maintain health, the ability to maintain a high level of fitness and performance, motives for maintaining a healthy lifestyle. It also allows determining the psychological-pedagogical and organizational-methodical and practical conditions of functioning of the methodical system; assessment of criteria, indicators and levels of students' readiness to use fitness technology in their professional activities. The basis of modelling the educational process by applying fitness technologies is a specially created form for reproducing the characteristics of the object we are studying. The pedagogical content of the model is manifested in the fact that it allows highlighting current and perspective tasks of the educational process, to identify and analyze the relationship between the probable, expected and desired changes of the studied object.

In the study of the methodical system, it is important that the model, in many cases, along with the cognitive goal, should provide a formative goal. That is, the process of modelling the methodical system has not only cognitive but also its inherently formative function, because the model is not only a tool of cognition but also a prototype of the state of the object being modelled, bears the structure of what is not yet in the objective reality. The construction and implementation of a methodical system for fitness technologies usage in the health and fitness activities of students of HEI require the solution of methodological, content, psychological and pedagogical, methodical and organizational tasks. *Methodological* tasks are solved by developing the concept of building a methodical system, defining its structure and content; designing and designing of its components; establishing relationships between its components. *The content tasks* are aimed at the personal-oriented choice of fitness technologies according to personal needs of students; taking into account the specific content of fitness technologies, depending on staffing and logistical equipment; the possibility of formation of individual physical and fitness needs, individual level of physical fitness, state of health, mastering of sports and technical skills, etc.

Solving *psychological and pedagogical* tasks requires the development of psychological, pedagogical, fitness and health facilities that allow the use of fitness technology based on the individual and psychological characteristics of students, namely: a) to create individual motor trajectories of mastering the content of fitness technologies; b) to apply methods and forms of fitness technologies according to the peculiarities of interpersonal interaction and mastery of the material.

The solution of *methodical problems* is connected with: the creation of effective methods of activating of physical-fitness activity of students; developing a complete system of methods and forms that are appropriate for the state of health, level of physical fitness and features of future professional activity; with the development of methodical support for the use of fitness technologies in later life. The solution of *organizational tasks* is connected with: analysis of possibilities of application of different fitness technologies; with the organization of the group, collective and individual physical and fitness activities; providing physical fitness activities with modern fitness technologies.

Therefore, we fully share the opinion Hryban (2012), which states that the methodical system of physical education is a complex phenomenon, which consists of numerous components that form a certain aggregate due to the existence of internal connections between them. By term *"fitness technologies application methodical system"* we consider a set of teaching methods of various types of physical activity and their combinations, aimed at promoting health and ensuring a high level of physical fitness and efficiency of students. The created structure model usage fitness-technology in student physical education includes

(Figure 1): *purpose, task, content, principles, methods, forms, means and tests*. A system-functional approach to the study of the methodical system involves understanding the system as a multidimensional and multistage structure with many parameters, as a complex internally integrated social organism that can be analyzed and explained; as a set of elements, properties and relationships that interact and develop. The main features of systematicity include integrity and purposefulness, structure, composition of elements, internal division, ordering, classification of the whole; the relationship of external and internal; integration of individual elements and connections. The methodological system of application of fitness technologies has the following requirements: 1) all sports and mass events are health-improving; 2) aimed at comprehensive development and increasing students' work capacity in the future life; 3) components of fitness technologies provide the necessary level of physical activity of students.

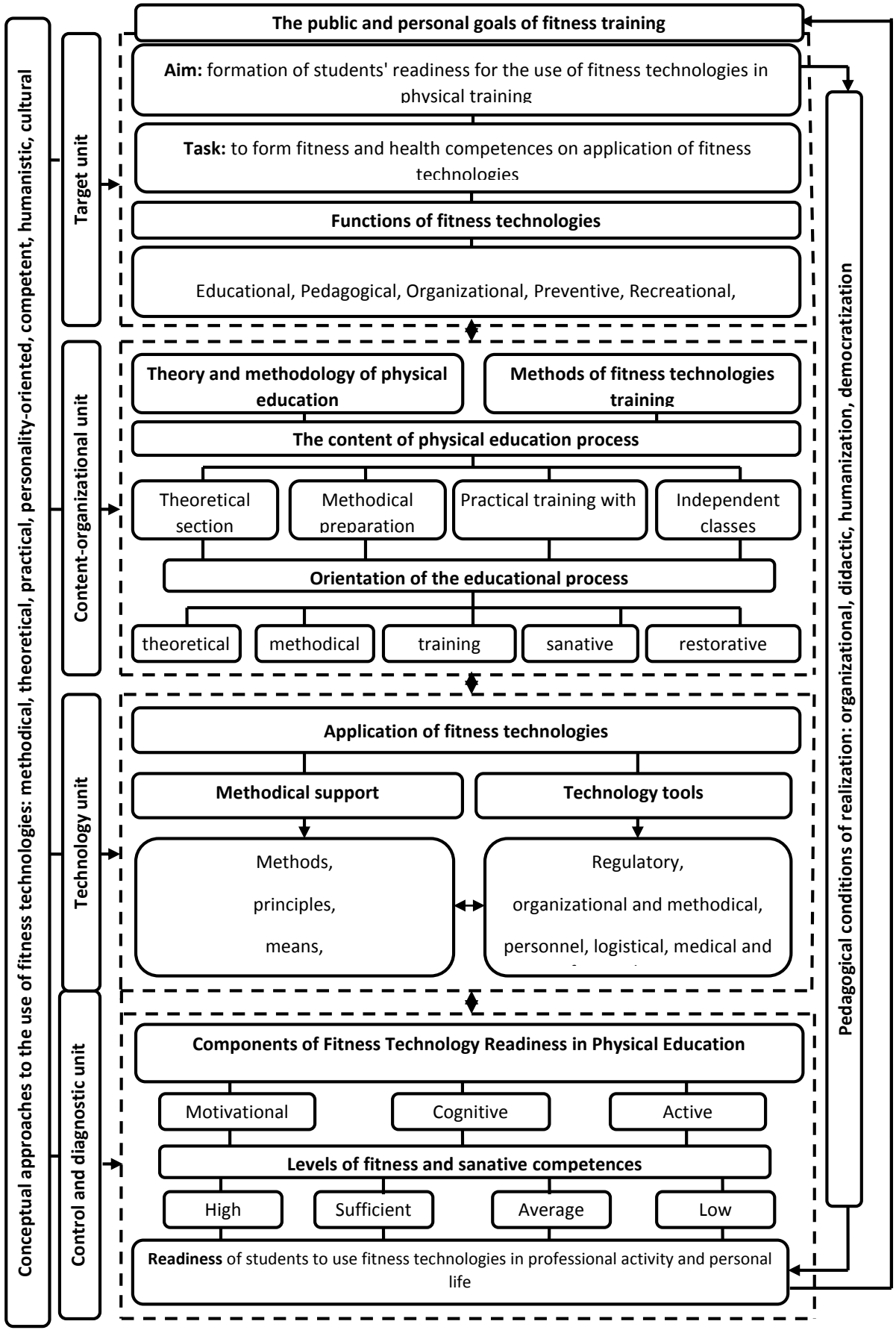
Conceptual approaches to the use of fitness technologies: methodical, theoretical, practical, personality-oriented, competent, humanistic, cultural
Target unit
Content-organizational unit
Technology unit
Control and diagnostic unit
Pedagogical conditions of realization: organizational, didactic, humanization, democratization
The public and personal goals of fitness training
Aim: formation of students' readiness for the use of fitness technologies in physical training
Task: to form fitness and health competences on application of fitness technologies
Functions of fitness technologies
Educational, Pedagogical, Organizational, Preventive, Recreational,
Theory and methodology of physical education
Methods of fitness technologies training
The content of physical education process
Theoretical section
Methodical preparation
Practical training with
Independent classes
Orientation of the educational process
theoretical
methodical
training
sanative
restorative
Application of fitness technologies
Methodical support
Technology tools
Methods,
principles,
means,
Regulatory,
organizational and methodical,
personnel, logistical, medical and
Components of Fitness Technology Readiness in Physical Education
Motivational
Cognitive
Active
Levels of fitness and sanative competences
High
Sufficient
Average
Low
Readiness of students to use fitness technologies in professional activity and personal life

***Fig. 1.*** *The structure model of methodical system usage fitness-technology in student physical education*

Researches of scientists (Antonova, 2015; Zhamardiy et al., 2020) clearly state that the methodical system should also solve the following functions: *diagnostic-corrective, motivational-mobilizing, developmental, communicative-educational, analytical-evaluative.* The main reasons that prevent you from attending fitness classes: lack of free time (for men – 63.81%, for women – 86.39%); laziness (for men – 31.91%, for women – 27.53%); poor conditions and lack of sports equipment for training (for men – 11.28%, for women – 18.04%); low level of physical fitness (men – 9.34%, women – 10.13%). There are other reasons – the lack of a sports uniform and funds for the purchase of subscriptions and more. The analysis shows that even before admission, students have a very low motivation for playing sports. They cannot use their free time correctly. Also, sports do not always lead to good health, emotional recovery. Violation of the methodology for conducting classes, lack of physical activity, the level of functional readiness of students lead to the appearance of negative, cause fatigue, bad mood and depression. Therefore, in the implementation of the target block of this system, it is necessary: 1) to clearly define the values of fitness technologies, their place and role in a healthy lifestyle; 2) determine the most effective and affordable fitness technologies; 3) to develop and implement incentives for the development of interests and motives for fitness; 4) to form new relationships between students and teachers based on interaction; 5) to reorient the educational process to recovery; 6) to develop and introduce new forms of independent exercises in fitness technologies, to intensify student self-government; 7) involve students in a personality-oriented choice of fitness technologies. Thus, the convergence of the goals of the social order to the training of future professionals forms the goal of a methodical system of fitness technologies application, which provides for constant updating and improvement of the students' fitness process, namely: updating the content, forms and methods of using fitness technologies in the educational environment of institutions higher education.

The *content-organizational block* is based on the general didactic and partially didactic principles, and also meets the criteria of selection of the means and forms of fitness technologies, which can be applied both in the physical education and during independent physical education classes. The content of fitness technologies should be designed in such a way that students can achieve goals and objectives that provide the necessary health, fitness and performance, and generate sustainable interest and motivation for a healthy lifestyle. Each fitness technology involves the development of physical qualities, the formation of basic motor skills, provides health promotion and hardening of the body, etc. It is taken into account that the maximum efficiency of each fitness technology will be realized by the personal-oriented choice of physical activity, motivational and value preference of students.

The *technological block* provides students with mastering the system of knowledge, the formation of fitness and wellness skills. The foundation of the technological block is the educational-methodical complex in the discipline "Physical education" (lectures, practical, consultations, independent lessons, manuals, methodical recommendations, sets of tasks, means for self-preparation, test complexes, evaluation criteria of students in physical education, etc.). It is the technology of teaching physical education that reveals the conditions for the functioning of the methodical system, that is, in our case, the planned use of fitness technology to ensure the fulfilment of physical education tasks. Implementation of the technological block of the methodical system involves the use of three groups of methods, namely: *methods aimed at mastering knowledge; techniques aimed at mastering motor skills; methods aimed at the development of physical qualities*. The main factors contributing to the positive attitude of students to the fitness technology classes are: control of the department of physical education (men – 49.03%, women – 53.48%), responsibility for the level of physical fitness (men – 32.30%, women – 34.49%), responsibility and discipline (men – 26.07%, women – 28.16%) shown in Table 1.

Student survey indicators have shown that the factors that encourage students to take up fitness training have a different impact on students during their study and after-school hours. The most attractive factor for the pursuit of fitness technology in the after-school hours is the accessibility and comfort of sports facilities, which was indicated by 55.64% of men and 50.32% of women. 54.86% of students and 43.67% of students must understand their responsibility for their level of fitness. Therefore, students' physical improvement needs are a mental state characterized by an attraction to practising fitness to develop their physical qualities and promote health. The vital need to meet such needs leads to a student's motive for action.

***Table 1.*** *The main factors of positive attitude of students to fitness training during the training process in physical education and extracurricular physical-fitness activities (men: n=257; women: n=316), %*

| Factors | Gender | Educational time | Extraordinary time |
|---|---|---|---|
| Control of the Department of Physical Education and the Dean's office on the educational process | man<br>women | 49.03<br>53.48 | 16.73<br>19.94 |
| Responsibility for the level of fitness | man<br>women | 32.30<br>34.49 | 54.86<br>43.67 |
| Responsibility and discipline | man<br>women | 26.07<br>28.16 | 21.01<br>20.89 |
| The pleasure of the emotional appeal of fitness training | man<br>women | 21.01<br>29.43 | 27.63<br>31.33 |
| Accessibility and comfort of sports facilities | man<br>women | 19.84<br>24.68 | 55.64<br>50.32 |
| Example and skill of the teacher, attentiveness and kindness | man<br>women | 16.34<br>23.42 | 15.18<br>31.91 |
| Example of parents and friends | man<br>women | 8.97<br>11.39 | 18.68<br>17.09 |

The effectiveness of fitness classes is significantly influenced by the form of training. The greatest preference is given to classes in sports sections under the guidance of a teacher (30.75% of men and 37.66% of women). An important place is occupied by independent classes with colleagues (28.40% – men and 29.75% women), training classes are less attractive to students shown in Table 2.

***Table 2.*** *Forms of fitness training preferred by students (men: n=257; women: n=316), %*

| Forms of fitness training | Men | Women |
|---|---|---|
| Classes in sports sections under the guidance of the teacher | 30.75 | 37.66 |
| Independent classes with colleagues | 28.40 | 29.75 |
| Scheduled classes | 21.01 | 24.36 |
| Independent individual leisure activities | 19.84 | 8.23 |

The content of fitness technologies, the place of their conducting, the emotional climate in the classes and the student-oriented choice of the means of development of physical qualities largely depends on the quality and effectiveness of physical-fitness activities in their free time. Therefore, one of the mechanisms of forming a positive attitude of students to the use of fitness technologies in the process of physical education is to activate social activity to a healthy lifestyle, to provide psychological and social training to overcome the difficulties in the self-realization of the individual in fitness activities.

The *control-diagnostic block* provides for monitoring and diagnostics of the level of students' knowledge, practical skills, level of physical fitness and mastery of fitness technologies. This unit provides for monitoring and evaluating the effectiveness of the use of fitness technologies, which allow checking the formation of the target, content, organizational and technological blocks of the methodical system.

**4. Discussion**

The methodical system of fitness technologies takes into account the following basic provisions:

1) physical education process of students is constructed as a methodical system, which has its purpose, tasks, content, methods, forms and means of physical and health activity;

2) in connection with the elimination of the discipline "Physical Education" in the curricula of higher educational institutions, physical and health activity is obligatory in the educational process of universities throughout the study period and should be considered in the unity of content, procedural and productive components;

3) theoretical information on health education should be a system of knowledge of history, psychology, pedagogy, anatomy, physiology, hygiene, ecology, biochemistry, nutrition, ethics, aesthetics, etc.;

4) physical enhancement, health improvement, boost fitness and performance is the result of students' free choice to use fitness technologies;

5) methodical system should provide: comprehensive physical training, be aimed at preserving health, the formation of efficiency; to provide the necessary educational level of knowledge in the physical education and health education and the norms of a healthy lifestyle; to promote the prevention of bad habits (alcohol, drugs, smoking, gambling), rational use of leisure time and recreation, etc.

6) methods, forms and means of fitness technology should be adequate to the level of physical fitness and health of students.

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